

CLAIMS

[cl001] 1. A dental curing light comprising:

a wand adapted to be grasped by a human hand,
a battery power source located within said wand,
electronic control circuitry located within said wand,
a light module attached to said wand,

said light module including an elongate heat sink with a proximal end and a distal end, said proximal end being proximate said wand, said elongate heat sink having a longitudinal axis,

a mounting platform located at said elongate heat sink distal end, said mounting platform being adapted to have a light emitting semiconductor device mounted thereon, and

a light emitting semiconductor device mounted on said mounting platform by use of heat conductive and light reflective adhesive.

[cl002] 2. A dental curing light as recited in claim 1 wherein said light emitting semiconductor device is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip array, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.

[cl003] 3. A dental curing light as recited in claim 1 wherein said light emitting semiconductor device utilizes a driving current of not more than about 350 milliamps.

[cl004] 4. A dental curing light as recited in claim 1 further comprising at least one air vent on said wand.

[cl005] 5. A dental curing light as recited in claim 1 wherein said mounting platform is oriented so that when a light emitting semiconductor device is mounted on it, light emitted by the light emitting semiconductor device will be emitted generally orthogonal to said elongate heat sink longitudinal axis.

[cl006] 6. A dental curing light as recited in claim 1 wherein said mounting platform is oriented so that when a light emitting semiconductor device is mounted on it, light emitted by the light emitting semiconductor device will be emitted at an angle of from about 30 degrees to about 150 degrees to said elongate heat sink longitudinal axis.

[cl007] 7. A dental curing light comprising:

- a wand adapted to be grasped by a human hand,
- a battery power source located within said wand,
- electronic control circuitry located within said wand,
- a light module attached to said wand,
- said light module including an elongate heat sink with a proximal end and a distal end, said proximal end being proximate said wand, said elongate heat sink having a longitudinal axis, and elongate heat sink being adapted to draw heat away from a semiconductor located at said elongate heat sink distal end,
- a mounting platform located at said elongate heat sink distal end,
- a primary heat sink mounted to said mounting platform, and
- a light emitting semiconductor device affixed to said primary heat sink.

[cl008] 8. A dental curing light as recited in claim 7 wherein said light emitting semiconductor device is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip array, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.

[cl009] 9. A dental curing light as recited in claim 7 wherein said light emitting semiconductor device utilizes a driving current of not more than about 350 milliamps.

[cl010] 10. A dental curing light as recited in claim 7 further comprising at least one air vent on said wand.

[cl011] 11. A dental curing light as recited in claim 7 wherein said mounting platform is oriented so that when a light emitting semiconductor device is mounted on it, light emitted by the light emitting semiconductor device will be emitted generally orthogonal to said elongate heat sink longitudinal axis.

[cl012] 12. A dental curing light as recited in claim 7 wherein said mounting platform is oriented so that when a light emitting semiconductor device is mounted on it, light emitted by the light emitting semiconductor device will be emitted at an angle of from about 30 degrees to about 150 degrees to said elongate heat sink longitudinal axis.

[cl013] 13. A dental curing light as recited in claim 7 further comprising a well in said primary heat sink, said light emitting semiconductor device being located in said well.

[cl014] 14. A dental curing light as recited in claim 13 wherein said well includes a light reflective coating on its interior.

[cl015] 15. A dental curing light as recited in claim 13 wherein said light emitting semiconductor device is affixed to said primary heat sink by use of heat conductive and light reflective adhesive.

[cl016] 16. A dental curing light as recited in claim 13 further comprising a cover over said light emitting semiconductor device.

[cl017] 17. A dental curing light as recited in claim 16 wherein said cover is selected from the group consisting of windows and focus lenses.

[cl018] 18. A dental curing light comprising:
a wand designed to be grasped by a human hand,
controls for initiating and terminating light transmission by the dental curing light,
circuitry in electrical connection with said controls,
a power source for powering the dental curing light,
a light source, the light source including:
a light emitting semiconductor device,
a primary heat sink to which said light emitting semiconductor device is affixed
an elongate secondary heat sink to which said primary heat sink is
affixed,

said primary heat sink being adapted to draw heat away from said light emitting semiconductor device, said elongate secondary heat sink being adapted to draw heat away from said primary heat sink and to dissipate said heat.

[cl019] 19. A dental curing light as recited in claim 18 wherein said primary heat sink has a well on it, and wherein said light emitting semiconductor is mounted in said well.

[cl020] 20. A dental curing light as recited in claim 19 wherein said well has a light-reflective surface.

[cl021] 21. A dental curing light comprising:
a wand designed to be grasped by a human hand,
controls for initiating and terminating light transmission by the dental curing light,
circuitry in electrical connection with said controls,
a light source, the light source including:
a light emitting semiconductor device,
a primary heat sink to which said light emitting semiconductor device is affixed,
an elongate secondary heat sink having a proximal end and a distal end,
a mounting platform located at said secondary heat sink distal end, said primary heat sink being affixed to said mounting platform,
said primary heat sink being adapted to draw heat away from said light emitting semiconductor device, said elongate secondary heat sink being adapted to draw heat away from said primary heat sink and to dissipate said heat.

[cl022] 22. A dental curing light comprising:
a light module,
an elongate heat sink located in said light module, said elongate heat sink having a proximal end, a distal end and a longitudinal axis therebetween, said elongate heat sink being part of said light module,
a mounting platform located at said elongate heat sink distal end,
a primary heat sink mounted to said mounting platform, said primary heat sink being smaller in overall volume than said elongate heat sink,

a well located on said primary heat sink,
a light emitting semiconductor device mounted in said well of said primary heat sink.

[cl023] 23. A dental curing light comprising:

a light module,
an elongate heat sink located in said light module, said elongate heat sink having a proximal end, a distal end and a longitudinal axis therebetween, said elongate heat sink being part of said light module,
a mounting platform located at said elongate heat sink distal end,
a primary heat sink mounted to said mounting platform, said primary heat sink being smaller in overall volume than said elongate heat sink,
a light emitting semiconductor device mounted to said primary heat sink.